

REMARKS

In this response, independent Claims 1, 35, and 65 and dependent Claims 14, 15, 41, 44, 45, 66, 70, and 71 are amended, and Claims 42 and 69 are cancelled without prejudice. Claims 1 – 41, 43 – 68, and 70 – 73 are now pending in the application. Claims 16 - 34 and 46-64 (Group II) are withdrawn by action of the Examiner as being drawn to a non-elected invention respective to the provisional election, made with traverse, to prosecute the invention of Claims 1 – 15, 35 – 45, and 65 - 73, in a telephone conversation between the Examiner and Applicants' representative, Ronald Wangerow, on December 1, 2005.

REJECTION UNDER 35 U.S.C. § 103

In the Office Action, the Examiner required restriction to one of two allegedly distinct inventions:

Group I: Claims 1 – 15, drawn to magnetizable compositions; and

Group II: Claims 16 – 34, drawn to an encoder.

The Examiner alleges that the two groups of claims are related as “mutual exclusive species in an intermediate-final product relationship.”

Applicants respectfully traverse the restriction requirement. Applicants submit that the subject matter of these two groups of claims is sufficiently related as to create no undue burden on the Examiner. In this regard, the Examiner has not stated a specific class or subclass for the subject matter of Group II. Rather, the subject matter of both claims relates to compositions comprising thermoplastic elastomer, elastomeric polymer, and magnetizable powder. Regardless of whether such compositions may be used for articles other than encoders, Applicants submit that a search of such compositions would subsume subject matter of both groups of claims.

Accordingly, Applicants submit the restriction is improper, and request examination of all claims. Nevertheless, as requested by the Examiner, Applicants hereby affirm that election of Group I claims and have accordingly designated Claims 16 - 34 and 46 - 64 as “withdrawn” in this Response.

REJECTION UNDER 35 U.S.C. § 103

Claims 1 – 15, 35 – 45, and 65 – 73 are rejected under 35 USC. § 103(b) as unpatentable over U.S. Patent 6,500,374 to Akioka et al. (“Akioka”); U.S. Patent 6,774,171 to Kassa et al. (“Kassa”); U.S. Patent 6,872,325 to Bandyopadhyay et al. (“Bandyopadhyay”); or U.S. Patent 6,939,477 to Stark et al. (“Stark”). This rejection is respectfully traversed.

Independent Claims 1, 35, and 65 (all independent Claims) and dependent Claims 14, 15, 44, 45, 66, 70, and 71 have been amended; and Claims 42 and 69 have been cancelled without prejudice. Claim 1 has been amended to provide that cured elastomeric polymer is in a weight ratio of from about 1:10 to about 3:1 to thermoplastic polymer. Claim 35 has been amended to provide that the elastomeric polymer is present at a level of from about 25% to 75% of the thermoplastic material. Claim 65 has been amended to provide that elastomeric material is in a weight ratio of from about 1:10 to about 3:1 to the thermoplastic material in the blend. Basis for the amendments is in the originally-filed claims and in the specification with emphasis upon paragraph 0035 (page 11), paragraph 0038 (page 11), and paragraph 0039 (pages 11 and 12).

Dependent Claims 14 and 15 have been amended to align with amendments in the independent Claim 1. Claim 41 has been amended to focus on an embodiment of the invention. Claim 44 has been amended to specify a preferred ratio of elastomer to thermoplastic indicated in the specification in the last sentence of paragraph 0038 on page 11. Dependent Claims 45 and 66 have also been amended to correct minor spelling and/or typographical errors. Claims 70 and

71 have been amended to be dependent directly upon Claim 65 in view of the cancellation of Claim 69.

Turning now to the cited references of the Office Action, Akioka discusses a method of extrusion of magnetic powder blended into a binder resin using a vertical extrusion direction. The reason for using the vertical extrusion direction is to nullify the effect of gravity in distributing the magnetic powder within the resin (column 10 lines 41 – 49). The binding resin may be a thermosetting resin or a thermoplastic resin. The Examples of Akioka disclose polyamides, liquid crystal polymer, polyphenylene sulfide, epoxy, and polyimide resins. Importantly, elastomers are not specified or referenced as being a part of any of the Examples in Akioka. Indeed, Akioka doesn't appear to mention elastomers or elastomeric aspects. Akioka therefore does not address, consider, or anticipate the use of elastomers in Applicants' invention, nor provide any suggestion of the limitations detailing weight ratio aspects between elastomeric material and thermoplastic material in blends and/or compositions referenced by amended independent Claims 1, 35, and 65. Furthermore, as brought forth with some emphasis in paragraphs 0003, 0004, 0038, 0039, and 0071 of the specification of the present invention, the problem being addressed in the present invention relates to combining a significant amount of magnetic material into a blend that also has a significant amount of elastomeric material (elastomer or elastomeric polymer). Akioka, in defining a process for defeating the effects of gravity in evenly distributing magnetic material within a resin, appears to be focused upon an effectively different purpose, and doesn't deal with elastomeric aspects. For at least these reasons, Applicants respectfully submit that Akioka does not establish a basis for prima facie obviousness in the amended independent claims or in the dependent claims of the present invention.

Kassa discusses polymeric blends of a polymer, a magnetic material, and an additive such as a tackifier or flexibility agent. The polymer is 5 to 95 weight percent of the blend and can include elastomers, thermoplastics, thermosets, or combinations thereof (column 2 lines 10 – 25). Kassa discusses non-blended elastomer polymer and elastomer/elastomer polymer blends at column 3 lines 5 – 33, and Kassa discusses elastomer/thermoplastic blends at column 3 lines 34 to 47. Elastomer (including liquid elastomer) polymer is indicated at up to or greater than about 15% by weight of the overall composition, more preferably 1 – 10 weight percent, and still more preferably 2 – 4 weight percent when the polymer appears to be non-blended elastomer (column 3 lines 5 to 20). When a “polymer sub-mixture” (Kassa’s term at column 3 line 35 for blends of more than one polymer) of elastomer and another polymer is provided, the sub-mixture is indicated at up to or greater than about 15% by weight of the overall composition, more preferably 1 – 10 weight percent, and still more preferably 2 – 6 weight percent (column 2 lines 34 – 47). In discussing “polymer sub-mixtures” of elastomer and another polymer at column 2 lines 34 – 47 however, Kassa does not appear to reference use of liquid elastomers as done in column 3 lines 5 to 20 where the polymer appears to be non-blended elastomer. Kassa also doesn’t appear to discuss weight ratio aspects between elastomeric material and thermoplastic material in “sub-mixture” formulations. Kassa furthermore does not appear to specify that magnetic material in “sub-mixture” blends is distributed both in the thermoplastic polymer and also in the elastomeric polymer of the polymer “sub-mixture” when the sub-mixture is made of thermoplastic polymer and elastomer. Accordingly, the compositions of Kassa, to the extent they use elastomeric polymers, are preferably only very lightly loaded with elastomer relative to thermoplastic when compared to the loadings of elastomer to thermoplastic set forth in the amended claims of the present invention. For at least these reasons, Applicants respectfully

submit that Kassa does not establish a basis for prima facie obviousness in the amended independent claims or in the dependent claims of the present invention.

Stark discusses polymeric blends of a thermoplastic polymer and a ferro-magnetic material with a specific Currie temperature for a layer in a multilayer composite where the layer is bonded through use of induction heating to raise the temperature of the layer (having the ferro-magnetic material) to the Currie temperature. The thermoplastic polymer can be of one composition or of blended composition (column 3 lines 37 to 47), but appears to be definitely always thermoplastic (column 2 line 67). In some embodiments of Stark (column 4 lines 27 to 55 and column 9 lines 4 to 17), a thermoplastic is layered to a thermoset that is “co-cured” with the induction-heated bonding process. But Stark doesn’t discuss elastomer or rubber materials. Applicants therefore submit that Stark does not suggest the compositions of Claims 1, 35. For at least these reasons, Applicants respectfully submit that Stark does not establish a basis for prima facie obviousness in the amended independent claims or in the dependent claims of the present invention.

Bandyopadhyay describes blends of polymer and magnetic powder for making injection molded magnetizable electrical components that are too geometrically complex for convenient sintered blend formation. The relationship between the standard deviation and the mean for the magnetic powder particle size is controlled in Bandyopadhyay to achieve a desired magnetic permeability (“magnetic flux” / “magnetic field strength”) in the finished component. An extensive general listing of polymers is provided from column 4 line 43 to column 5 line 13. However, Bandyopadhyay provides little suggestion to use mixtures of thermoplastic and elastomeric polymers. Indeed, specific preferred embodiments are said to either include polyolefins or poly(arylene sulfides). See, Bandyopadhyay, at Column 5, lines 11 – 17.

Moreover, Bandyopadhyay provides no suggestion regarding the specific weight ratio aspects between elastomeric material and thermoplastic material in polymeric formulations when such a combination of the listed polymers might be used. Applicants therefore submit that Bandyopadhyay does not meaningfully suggest blends and/or compositions referenced by amended independent Claims 1, 35, and 65 and, by dependence, all other non-withdrawn and non-cancelled pending claims in the present invention respective to limitations detailing weight ratio aspects between elastomeric material and thermoplastic material. For at least these reasons, Applicants respectfully submit that Bandyopadhyay does not establish a basis for prima facie obviousness in the amended independent claims or in the dependent claims of the present invention.

As noted above, none of Akioka, Kassa, Stark, and Bandyopadhyay meaningfully suggests blends and/or compositions of Claims 1, 35, and 65 and, by dependence, all other non-withdrawn and non-cancelled pending claims in the present invention respective to blends of thermoplastic and elastomeric polymers in general, and the specific weight ratio aspects between elastomeric material and thermoplastic material, in particular. Therefore, Applicants submit that Akioka, Kassa, Stark, and Bandyopadhyay do not singly or in any combination establish a basis for prima facie obviousness in the amended independent claims or in the dependent claims of the present invention. Applicants accordingly request that the respective rejections under 35 U.S.C. § 103(a) be withdrawn.

PROVISIONAL REJECTION UNDER NON-STATORY OBVIOUSNESS DOUBLE PATENTING

Claims 1 – 15, 35 – 45, and 65 – 73 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1 – 22 and 47

– 56 of copending Application No. 10/424,642. Copending Application No. 10/424,642 will be abandoned by Applicants, obviating this rejection. (Applicants will provide the Examiner with a copy of the abandonment when it is filed.) Applicants accordingly request that the nonstatutory obviousness-type double patenting rejection be withdrawn.

CONCLUSION

Applicants submit that a full and complete response has been made to the outstanding Office Action, and as such, the present application is in condition for allowance. Thus, favorable consideration of this amendment is respectfully requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (248) 641-1600.

Respectfully submitted,

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